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the role of
MEDICINE
for Emergency
PREPAREDNESS

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE / Public Health Service



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Final Report

**THE ROLE OF
Medicine
for Emergency Preparedness**

Edited by

Francis C. Jackson, M.D.

and

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September 1968

Prepared for

Office of Civil Defense

Office of the Secretary of the Army

Washington, D.C. 20310

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service, Health Services and Mental Health Administration, Division of
Emergency Health Services

THE ROLE OF Medicine for Emergency Preparedness

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The purpose of this publication is to provide the physician with an integrated guide to his responsibilities for the development and operation of the emergency health and medical services in his community. The responsibilities and interrelations of other emergency services are broadly defined along with the resources and responsibilities of the State and Federal Governments. Each subject is described under dual headings: Natural Disaster and Nuclear Disaster. This arrangement provides the reader with an opportunity to compare the two levels of disaster preparation and to visualize how preparation for nuclear disaster can often provide the community with an increased capability for responding to the needs of victims of a major natural or manmade disaster. Included in the text are discussions of problems which have arisen in communities which have experienced catastrophic local disasters. Provided in the appendixes is a variety of technical and reference information which will be useful to the physician in the upgrading of his community's emergency health service capability. This text does not deal with planning and providing for the transportation and care of the victims of automobile accidents or other unexpected trauma and acute onsets of illness which are routinely handled by the ongoing emergency services of our hospitals and communities.

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Prepared by

The Division of Emergency Health Services,

Public Health Service

in cooperation with

The Committee on Disaster Medical Care,

Council on National Security

of the American Medical Association,

The Committee on Trauma

of the American College of Surgeons,

and the

Office of Civil Defense,

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Department of Defense

U.S. DEPARTMENT OF

HEALTH, EDUCATION, AND WELFARE

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Division of Emergency Health Services

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PREFACE

An important responsibility of the medical and allied health disciplines is the provision of emergency medical and public health services in disasters. Because disasters frequently necessitate the rapid expansion of emergency services far beyond normal levels, it is at once evident that advance planning and organized preparation by the community is the only way to insure that effective emergency medical and other health services will be available when needed.

Although the responsibility for coordinating all disaster relief activities rests with the government in the stricken area, the effectiveness of any local disaster health and medical services will depend upon the close cooperation of the area's physicians, allied health personnel, hospitals, and voluntary health agencies.

Since 1945, the American Medical Association, through its Committee on Disaster Medical Care (formerly the Committee on Civil Defense) of the Council on National Security, has provided active leadership and counsel in the development of local and national plans for emergency medical services.

In 1959, a "Report on National Emergency Medical Care" was produced under contract with the Federal Government by a special commission under the leadership of H. C. Luehr, M.D., then Chairman of the Committee on Disaster Medical Care of the American Medical Association. This document dealt primarily with preparations for thermonuclear attack on the continental United States. Over 55,000 copies of a summary of the report were printed in booklet form and given wide distribution.

The 1959 report was developed on the assumption that there would be sufficient warning time prior to an enemy attack to permit evacuation of target cities and areas. Since the evolution of intercontinental ballistic missiles, such an assumption is no longer valid. Use of such weapons would permit little or no warning time, thereby making evacuation of many target zones essentially impossible.

Federal civil defense planning is now based on a public fallout shelter system. It envisions that in many areas, postattack, there will be a virtual cessation of organized emergency medical and health services until it is safe to emerge from shelter. During the shelter period, shelter inhabitants will have to meet most of their own health needs. Shelter health supplies will be limited, and physicians or other health personnel will not always be present. Surviving community hospitals would need to reorient their operations to meet the threat of radioactive fallout.

These new assumptions concerning a nuclear disaster as well as the frequency and scope of natural disasters have made obsolete both the "Report on National Emergency Medical Care" and its summary booklet. In 1964, the Committee on Disaster Medical Care recommended that an updated report be prepared and that more emphasis be placed upon planning, training, and organizing for natural disasters and other relatively localized catastrophes.

INTRODUCTION

When a hospital, community, or State accepts the responsibility for planning for disaster health services, consideration must be given to both natural disaster and nuclear disaster. A natural disaster would be any event, not due to war, which produces serious morbidity and mortality, often causing severe property damage to a community or State. A nuclear disaster would be a full-scale attack upon this country with thermonuclear weapons.

From a medical point of view, a disaster is any situation which produces morbidity or threats to health on such a scale that a significant overload is placed on existing medical care and public health facilities. The first responsibility of physicians and all other allied health personnel, therefore, is to recognize the possibility of a disaster within the community they serve and, secondly, to take the initiative for preparation of the community's health resources in order to prevent unnecessary suffering, disease, injury, or loss of life in the event of such a disaster. Such preparation requires the parallel development of all emergency services so that each may function effectively during a period of disaster. It is the responsibility of governmental authority to coordinate these emergency services.

A. DISASTER PROBLEMS

Natural Disaster

Catastrophic accidents—those in which more than five lives were lost—claimed the lives of almost 33,500 people in the United States in the quarter of a century from 1941 through 1965. Weather catastrophes—tornadoes, floods, hurricanes, and other storms—were responsible for about 6,000 deaths in that period. The rapid expansion of urban centers, the development of large industrial complexes, the continuing population growth, and the increasing speed, volume, and complexity of transportation greatly increase the possibilities of accidents involving large numbers of casualties (see app. 1).

Nuclear Disaster

Present world political conditions, together with the increasing nuclear capabilities of other nations, dictate that the constant possibility of a nuclear war must be recognized, not only at the national level but at the State and local levels as well. Following a nuclear attack, each community would have to exist on its own resources for an extended period.

In the event of an extensive thermonuclear attack upon this Nation, it is quite probable that one-third or more of the population could become casualties. Half of these casualties would be expected to survive for more than 30 days and would require medical care and, in many cases, long-term rehabilitation. The magnitude of casualties would depend on many factors such as timing and weather conditions.

Traumatic injuries would be the most common immediate attack effect while communicable diseases would constitute an increasing threat in the ensuing postattack period. During the period of shelter occupancy, crowded and perhaps primitive living conditions would produce a tremendous communicable disease problem. It is anticipated that after the first 3 to 14 days postattack, people would emerge from fallout shelters into an environment which would be severely lacking in the normal safeguards for the food and water supply. The environment might be grossly contaminated by pathological micro-organisms; disease vectors probably would be rapidly increasing; and resources to combat those health hazards could be severely curtailed. Disposal of the dead and sanitation of the environment would require immediate attention.

Compounding the problem, the casualty rate among physicians and allied health personnel is expected to be particularly high because these professions are concentrated in urban areas. Thus, medical manpower would be reduced at the time of greatest need. A large portion of hospital beds would be destroyed. Gross losses would occur in the medical supply industry, both in retail and warehouse inventories and in the manufacturing capability.

It is estimated that at least 20 percent and possibly as much as 50 percent of the Nation's present hospital bed capacity could be lost as a result of a nuclear attack. It is possible that as much as 70 percent of the preattack pharmaceutical production capability could be lost, depending upon the part of the country which sustained the attack.

Radioactive fallout would also cause major problems. It would be impossible to begin organized emergency medical care until radioactivity had fallen to safe levels. To attempt immediate rescue operations would cause increased morbidity of essential health personnel. If the attack were nationwide, assistance from outside the damaged areas could not be expected. Each community must plan to be self-sufficient for as long as possible postattack. It should be able to provide its own essential services and to survive on locally available supplies for at least 30 days.

B. PLANNING AND PREPARATION

Natural Disaster

The experiences of communities which have suffered major natural disasters clearly show that emergency medical and public health services cannot function effectively without prior planning and close cooperation between health personnel and all other essential emergency services of the community.

Efficient disaster medical services must depend upon the provision of communications, fire and rescue, transportation, police protection, and other emergency services provided by the community authorities.

Because a natural disaster is most often confined to a limited geographical area, outside assistance is usually available within a short period of time. Services and supplies can be provided from local or regional sources in ample quantities. Nevertheless, immediately following the disaster there is often a critical period when certain emergency services and resources, including medical care, must be immediately available within the stricken community. Resources already present in the area must be used as efficiently as possible.

The primary objective of disaster planning is to insure efficient utilization of local health resources so that they will not be overwhelmed during the initial disaster relief period when emergency medical care and first aid are needed for the casualties.

Nuclear Disaster

Many of the same health problems would be met in either natural or nuclear disaster—the main variation being that the volume and severity would increase with the magnitude of the disaster. The planning which prepares the community to cope with postattack health problems simultaneously prepares it for the lesser but more likely disasters—flood, hurricane, fire, or major accident—which strike many communities each year. Problems of public health protection (sanitation, water purification, etc.) can be severe following a natural disaster; following a nuclear disaster these problems could be overwhelming unless special predisaster planning and training have been devoted to this vital area of health care. Needless to say, cooperation among all community groups with essential disaster responsibilities is vital if there is to be a complete disaster preparedness program.



DISASTER MEDICINE

A. DEFINITION

The term "disaster medicine" as used in this guide must necessarily remain quite broad. It includes not only the medical profession itself, but the allied health professions, the hospitals, the health departments, and all governmental or community agencies, organizations, and services which directly or indirectly contribute to all phases of health care for survivors in a disaster. Therefore, such services as communications, transportation, and police security are vital for medical, as well as nonmedical, action during recovery from a disaster. These services are considered an integral part of disaster medicine since experience has shown that without them effective emergency medical and health functions are not possible and chaos frequently results. For the purpose of this document, however, only those factors which may directly affect the provision of adequate emergency health services will be discussed.

The natural disaster can and should be managed with a high degree of organization and with reasonable efficiency since its limitation to a single area usually permits the available services within the community or State to provide prompt assistance. Resources are essentially unlimited. Why, therefore, does a problem exist?

The confusion caused by a natural disaster combined with a lack of preplanning must invariably result in some delay in medical care. An initial lack of authority and leadership has proved to be the most common deficiency. This is usually followed by a succession of failures such as breakdown of communication among disaster agencies, failure to notify hospitals, inadequate security and safety for emergency personnel during the rescue period, failure to establish a medical or trained authority to oversee rescue and first aid, and, finally, a failure to sort and distribute survivors equitably to the available medical facilities. The most disturbing omission by authorities at a disaster site is almost always the delay or failure to notify hospitals that a disaster has occurred. Not only may such disorganization cause needless waste of health personnel and medical services, it can cause many survivors to receive less than optimum care.

The need to provide effective emergency medical services at the time of a disaster is one of the most difficult problems facing medical and health authorities in the Nation today. The role of medicine, however, should be quite clear. It must provide leadership, organization, and training for modern emergency health services within the framework of existing community governments, the hospital system, and health resources.

Existing health resources of the Nation are more than adequate to meet the challenge of natural disasters. Additional preparation is necessary to meet the greater challenge of assuring that the Nation can survive a thermonuclear attack.

B. COMMON PLANNING ERRORS

1. Lack of leadership from the community and from the health professions.
2. Lack of central coordinating authority for medical care.
3. Lack of areawide medical communications capability.
4. Lack of organized teams for onsite emergency medical care and sorting.
5. Lack of equitable distribution of casualties to hospitals.
6. Lack of effective disaster plans in hospitals.
7. Lack of a method of identification for disaster health workers.
8. Lack of police security at the disaster site and at the hospital.
9. Lack of traffic control throughout the disaster area and adjacent to hospitals.
10. Lack of early attention to prudent use of onhand inventories.
11. Lack of coordination of disaster relief activities.
12. Failure to establish adequate triage procedure at the hospital.

To summarize, all the difficulties included in the list above have been noted time and time again in disasters, but they are still frequently overlooked in predisaster planning. These are errors which can seriously hamper the efficiency of emergency medical services.

C. FEDERAL ASSISTANCE

In the first crucial hours of a disaster, the hospitals in the disaster area will be thrown on their own resources, for there will be no time to wait for outside assistance to arrive. There will be mounting numbers of casualties and dwindling supplies of critical medical items. With the almost inevitable breakdown of communications and transportation following a disaster, a hospital's usual sources of resupply could be inaccessible.

Two programs, administered by the Division of Emergency Health Services, U.S. Public Health Service, are designed to assure the availability of enough medical supplies to care for disaster victims. The Hospital Reserve Disaster Inventory (HRDI) program is placing 30-day supplies of essential items in the Nation's hospitals. The Packaged Disaster Hospital (PDH) program stores complete 200-bed units in selected community hospitals.

Initially, hospitals on the fringes of large metropolitan areas are being offered the HRDI units. Eventually, all hospitals of 50 or more beds will be given the opportunity to participate in this backup supply program. To help accomplish the rotation of limited shelf-life items, participating hospitals will use the HRDI supplies but continue their regular procurement schedule, thus maintaining a 30-day inventory of fresh items.

The PDH program is intended to permit the parent hospital to expand its patient-load capability by 200 beds. Also, a subsidiary hospital could be set up in another building if the hospital itself were not large enough to permit sufficient expansion or when damage or imminent danger forced its evacuation. Some 2,600 PDH's are now stored throughout the United States.



DISASTER MEDICAL SERVICES

A. CASUALTY CARE

Natural Disaster

Natural disasters seldom produce a local casualty workload of the overwhelming proportions which could be expected in nuclear attack. Following most small disasters, techniques and principles of care will be very similar to conventional methods (see app. II). However, in the large natural disaster which overtaxes the emergency health care facilities of the community so that normal standards of emergency medical care cannot always be maintained, mass casualty care techniques (similar to those employed by the military services) applied in varying degrees of stringency will be in order. In preparation for disasters, medical and allied health personnel should become familiar with these techniques so that available manpower and facilities can be best utilized.

The experience of hospitals providing emergency medical care to victims of all types of natural disasters has invariably indicated that without careful advance planning, medical personnel and facilities are never utilized in an optimum or appropriate manner and that patient care suffers proportionately.

Since surgical problems predominate in most disaster situations, many physicians normally practicing other specialties may be called upon to perform some surgical procedures. This would be necessary only when natural disasters or wartime operations result in a much greater need for emergency medical care than can be provided by the hospital with its own staff, using conventional treatment procedures.

Military casualty care experience shows that the highest mortality among surviving casualties occurs prior to arrival at the hospital. The basic principles of disaster medical care must be applied as soon as possible at the disaster site. *It is no longer acceptable for hemorrhage to go uncontrolled, fractures to remain unsplinted, or major wounds to be left uncovered while victims are transported to a medical facility.*

It is of utmost importance that casualties be sorted at the disaster site so that they can be dispatched to all available hospitals. Otherwise the nearest hospital may be so overloaded that it cannot function effectively. At the hospital, casualties should be classified promptly and assigned priorities for receipt of treatment. This sorting process involves both rapid diagnosis and an estimate of the prognosis of each condition. It is a heavy responsibility

and requires a highly competent physician who is well versed in disaster medical care procedures, such as surgeons with military experience or physicians who often treat major trauma in their practice.

Accurate medical statistics on the distribution of injuries among survivors of single natural disasters are not available and, because of the diverse character of these events, would be almost impossible to compile. A reasonable estimate¹ upon which to base the sorting process, however, is that of the injured survivors, 40 percent will require *minimal* or no medical care; 20 percent will require *immediate* or lifesaving care, and 40 percent can have their treatment *delayed* if necessary. In a natural disaster it should not be necessary to classify any casualties as *expectant*, the category in which the more seriously injured who have a poor prognosis are placed in order to concentrate on those casualties who will benefit most from relatively simple procedures. Support from outside the disaster area should be at hand soon enough to prevent the development of such a critical situation.

The sorting procedure, whether it begins at the disaster site or at time of admission to the hospital, must permit changing patients from one category to another as their conditions improve or worsen. As additional manpower and facilities become available, more patients can be classified in the *immediate* rather than the *delayed* category.

Nuclear Disaster

The provision of medical care for the survivors of a nuclear disaster has many unique requirements and generally calls for preparation on a much larger scale than for natural disasters. Of initial concern in the immediate target areas, there will be a delay in instituting emergency casualty care because of high levels of radioactivity during which the surviving population would be in fallout shelters. It is impossible to predict whether an attack upon the United States would be composed of "dirty" or "clean"² nuclear weapons. The alternatives available to the enemy are whether to detonate a weapon at a relatively high altitude and cause maximum blast damage and little radioactive fallout or to detonate the weapon at ground level which reduces greatly the blast damage but causes the maximum amount of radioactive fallout. Errors in aiming and detonation can be expected and a multitude of variables can affect radioactive fallout. Two comprehensive community plans must be prepared, one for almost immediate rescue operations in the event of a "clean" bomb and one for operations which would begin after a delay of 3 to 14 days during which time survivors would have been restricted to fallout shelters. Such a delay would obviously have a profound effect on the types and numbers of surviving casualties. The commencement of any rescue operations

¹ Hartgering, James B., MC, USA, "Sorting and Classification of Casualties," MIL MED, 118: (4) 307-310, April 1950.

² The terms "dirty" and "clean" are often used to describe the amount of radioactivity produced by a weapon. The intensity of the fallout radiation depends both on the weapon composition and the height of the burst.

would depend upon the capability for monitoring the levels of radioactivity. Without this capability, survivors who reached shelters would have no choice but to assume that there were high levels of radioactivity and remain in the shelter for as long as possible up to 2 weeks or until outside assistance notified the shelter occupants of the level of radioactivity outside. *Physicians and other essential personnel must be particularly careful to avoid undue exposure.* Their services will be critical to the recovery and rehabilitation of the surviving population.

If the emergency health service of the community is able to begin operations immediately after the nuclear attack, it is likely that among every 200 casualties requiring hospitalization, the following ranges of sickness and injury categories may be expected:

Sickness and injury categories:	Medical workload ¹ estimated per 200 hospitalized patients (conditions)
75 percent traumatic	150
45 percent burns	90
20 percent radiation	40
50 percent infections	100
10 percent all other ²	20
200 percent, or a medical workload of	400

¹ Description of the "Civil Defense Emergency Hospital and Standards Used for Determination of the Supply and Equipment Contents", 1962 program, Department of Health, Education, and Welfare, Public Health Service, Division of Health Mobilization, Washington, D.C., Feb. 1, 1962, 8 pp.

² Medically significant conditions which may appear as concurrent complications or, to a limited extent, warrant hospital admission.

These estimates are extrapolated from actual surveys of Nagasaki-Hiroshima casualties. Since many individuals suffered multiple injuries, the totals add up to more than 100 percent. In addition to the injuries from the initial attack, the threat of infectious disease will arise within 5 to 15 days postattack.

Burn and radiation casualties will impose a tremendous burden on the available medical facilities. Routing patients to medical care facilities would frequently be complicated by high levels of radiation and widespread destruction of roads and communication facilities. These factors will seriously hamper replenishment of supplies and equipment. If roads are open, those areas which are not damaged can receive and care for casualties from the damaged areas and can, in addition, send men and materials into the damaged areas to aid in casualty care. Because it is impossible to foresee what the situation will be, adequate disaster preparedness calls for each area to be as self-sufficient as possible.

¹ "The Effects of Nuclear Radiation," U.S. Department of Defense, U.S. Atomic Energy Commission, Washington, D.C., April 1962, 730 pp.

Regardless of the amount of manpower, material, and facilities available in a target area, the casualty load will immediately overwhelm the resources if traditional treatment methods are followed. In order to maximize the benefits of the available manpower and resources, the practice of sorting according to treatment priorities must begin at the emergency door of the hospital and must be continued throughout the hospital at all levels of care. The changing condition of the patient will call for alteration in priority of treatment.

In the early handling of a sudden influx of casualties, time, manpower, and space will take primary attention. The possibility of shortages of supplies is ordinarily forgotten as the first casualties begin arriving at the facility. As more and more casualties arrive, impending shortages of supplies become apparent and a hasty, ill-planned priority usage is belatedly set up. In the event of a nuclear disaster, conservation and rationing of expendable supplies on a most austere basis must begin immediately. For planning purposes, it must be assumed that onhand supplies will have to last as long as 30 days during which there will be a vastly increased patient load.

Each physician, regardless of his usual specialty, will become a traumatologist in the immediate postdisaster period. It is assumed that austere medical care will be followed for at least 6 months following a nuclear attack. This means that physicians will have little or no choice of medications within drug or treatment categories, that shortages of manpower and supplies will require compromising many usual treatment methods, that surviving buildings such as schools or motels may have to be used as hospitals because of destruction of medical facilities, that supplies of most of the currently available disposable items will be rapidly exhausted, that many paramedical and lay personnel must be utilized whenever possible in supporting medical care, and that control of environmental sanitation may become the most important resource in combating infectious diseases. Preventive medicine will be the keystone of survival.

B. EMERGENCY MEDICAL SERVICES

1. Responsibility

The chief executive of the local government is responsible for overall coordination of disaster-relief operations, including medical care and public health. This executive, with the advice of the community health officer or the local medical society and the local hospital administrators, should designate a chief physician who will be responsible for coordinating disaster medical and public health activities. The assignment will probably be given to the chief of the local health officer, or, if there is no health officer, to a representative of the county medical society or to some other respected physician. Close cooperation with the local hospital authorities is very important.

The designated chief physician should have a deputy for medical care and a deputy for public health. The deputy for medical care will coordinate

the disaster operation of the hospitals and other medical units. He should be a physician who is well informed about the techniques of mass casualty care and who is highly regarded by the local medical profession and hospital officials. In natural disasters, he may perform the entire coordinating function, since casualty care is likely to be the only health problem requiring immediate concerted action. The deputy for public health should be knowledgeable in public health practice, especially the techniques of environmental health and food protection. He may or may not be a physician.

2. The Control Center

Natural Disaster

In larger communities, especially those with more than one hospital emergency, medical care activities can best be coordinated from a headquarters or control center. The physician who has been designated as the medical authority to coordinate the community's emergency medical care activities or his alternate must be at this center during any disaster period. Arrangements must be made so that the headquarters can be staffed and activated immediately in disaster.

Because the telephone system will become overloaded almost immediately following the disaster, an alternate form of communication is essential if the medical and health resources are to be coordinated effectively with local government officials, police, fire, rescue, and other disaster relief agencies. This calls for two-way radio communication with other hospitals and with medical and rescue teams at the disaster site.

The control center should have organizational tables indicating the community's resources of personnel, hospital beds, supplies, and equipment. As the nature of the medical problems generated by the disaster become known, the current workloads and capabilities of the various medical facilities, and the availability of medical manpower and resources should be progressively reassessed. With this knowledge, the medical coordinator will be able to cooperate with the other elements of the rescue operation to assure the equitable distribution of casualties among the health facilities, the provision of needed health manpower and supplies at the disaster site, and the assistance of the police, fire, rescue units, the Red Cross, and other volunteer agencies.

In natural disasters, the deputy for medical care may serve alone at the center, coordinating emergency medical care at the disaster site, controlling the flow of casualties to hospitals, and arranging for cooperation with other disaster services. Because operations may proceed for several days, it is always wise to have designated alternates for all key positions.

Nuclear Disaster

In nuclear disaster, the control center will be completely staffed to coordinate and control all health and medical services, including public

health, for an indefinite time. This is in contrast to the relatively simple coordination of casualty care for a short time following a natural disaster. The size and complexity of the control center will depend upon community size (see app. IV for example staffing plan and responsibilities).

As soon as levels of radioactivity permit, the chief medical coordinator and his deputies will report to the center and begin activities. Their duties will be to arrange for an equitable distribution of the casualty workload among the available health facilities and to coordinate health services with other disaster services. In this situation, it is necessary to have alternates for each key position.

All surviving hospitals will be competing for scarce health resources (both medical supplies and manpower) and the control center must serve as local claimant for all of these resources so that the most urgent needs of all facilities can be met. In some areas, the center will have to designate manpower and supplies to set up refugee centers.

If it is possible to man the center during the shelter period, and if communications between the center and the shelters can be established, consultation on shelter health problems may be given.

C. DISASTER MEDICAL TEAMS

Natural Disaster

The traditional responsibility and authority of physicians for the care of patients in medical facilities should be extended in natural disaster to the disaster site itself. Predesignated disaster medical teams, composed of physicians, nurses, and personnel trained in rescue, first aid, or medical self-help, should be ready at all times to report immediately to the site of a major disaster. These teams could be available for community, State, or regional assignment. Whether there are organized teams in the area or not, individual physicians should maintain their own emergency bag of supplies in their vehicles at all times.

One person must be assigned the responsibility of deciding when conditions call for a team at a disaster site and for designating who will be in charge of the team or teams. When more than one team is available, he must also decide how many medical people to dispatch to the site. He can be alerted by any responsible official, such as the police chief, fire chief, or the civil defense director. Team personnel assignments should be maintained on a rotating basis to assure around-the-clock coverage. Responsibility for maintaining such assignments should be assumed by individual hospitals, assisted by the local medical society, local hospital association, or council. Each hospital may maintain its own teams or it may arrange to staff teams jointly with other hospitals or with the local Red Cross chapter. Care must be taken in planning for these teams to see that physicians who are affiliated with several hospitals are not named on the disaster team of more than one hospital. The supplies and equipment needed by the teams should be maintained at the hos-

pital in the form of preassembled kits ready to be transported on short notice to the disaster site.

The medical supply kits brought to the disaster site must contain supplies and equipment in accord with requirements for resuscitation and initial emergency care. The kit should include emergency medical tags, which can be attached to each casualty so that his name, when available, can be recorded, as well as a tentative diagnosis and any treatment he receives prior to arrival at the hospital.

Disaster medical planners must develop their plans and procedures in cooperation with police and fire officials and ambulance operators to insure the cooperation of their units with the medical teams, particularly in connection with rescue, transportation, and traffic control.

The medical team physician must have ultimate authority in all matters pertaining to the care and handling of casualties at the disaster scene and en route to the hospital. If more than one team is dispatched to a single disaster site, one of the team physicians must be given authority over all teams. All personnel at a disaster site, including medical team members, however, will come under the overall authority of the police or fire officials in charge. The medical control center should be in close communication with the official who is directing overall operations and with the team physician.

Provisions should be made, also, for communications between the medical teams and the medical disaster headquarters, hospitals, and other health units. Teams should have their own portable two-way radio equipment, but when they do not, they must arrange to contact hospitals and other health facilities via police or fire department radio equipment.

The disaster medical team will provide guidance to rescue personnel in order to prevent further injuries or unnecessary suffering. They will immediately begin procedures necessary to save life and to prepare the casualties for transportation to hospitals. These procedures include clearing airway and giving resuscitation, controlling hemorrhage, splinting fractures, and instituting appropriate shock treatment.

The physician in charge must sort casualties according to their condition, assigning them priorities for transportation and indicating which hospital they are to be taken to. His authority to give these directions should be clearly understood by all drivers. If he is in communication with the control center or with individual community hospitals, he can dispatch the ambulances according to the information he receives from the center. If not, he can apportion the casualties among hospitals according to his prior knowledge of relative capacities and capabilities of the hospitals and their proximity to the disaster site. Distance to the hospital, however, should not be a predominant consideration when the number of casualties is great.

An area at the disaster site should be set aside for a temporary morgue at the direction of the responsible coroner or medical examiner. The dead should be certified on the spot. Ordinarily, removal of the bodies can be delayed until all surviving casualties have been taken to hospitals.

Nuclear Disaster

Following a nuclear disaster, activities of a rescue medical team will be dictated by the radiation levels in the disaster area. Rescue operations should not be initiated until the threat from radioactive fallout has diminished to an acceptable point. The type of rescue operations will depend upon how soon radiation levels permit operations in the affected area. If the area is immediately accessible to rescue operations, then the mission will be concerned primarily with casualties caused by fire and blast effects. If the rescue operations are not initiated until the end of a 2-week shelter period, it is expected that the only surviving casualties will be those who were able to reach a fallout shelter. Of these, the most seriously injured would have little chance of survival after 2 weeks in a crowded shelter without professional emergency care. The casualty load that emerges from the shelter will be those who were only slightly or moderately injured and who, hopefully, were able to receive some supportive care. No doubt many of those moderately injured will be in acute need of medical care not only for the original condition but for treatment of the myriad of complications which could have developed during the shelter period. In addition to these casualties directly affected by the nuclear attack, there will be the accumulation of 2 weeks of health problems, particularly communicable disease, which could be markedly increased by the austere living conditions of the shelter period. Immediately following the shelter period, the population will be exposed to additional hazards due to loss of normal safeguards of environmental sanitation. Nuclear disaster health teams would therefore have three major responsibilities:

1. Sorting and evacuation of the seriously injured and sick to treatment facilities.
2. Initial care of those whose health problems can be met outside of the hospital, including initiating a home care program for the recovery period. Because of lack of communication, this followup care may be coordinated centrally, but would have to be organized on a neighborhood self-help basis.
3. Epidemic control, the initiation of sanitary measures for food and water supplies, the provision of vector control, and the immunization of the surviving population. These measures could be carried out by teams dispatched from a central coordination point. Because of the acute need for professional health personnel at hospitals and emergency treatment facilities, these public health teams may have to be composed entirely of trained laymen, however, professional personnel will serve in any capacity where their skills and training are most needed.

D. THE HOSPITAL

Natural Disaster

All hospitals that are accredited by the Joint Commission on Accreditation of Hospitals and many registered hospitals have written disaster opera-

tion plans which they are required to rehearse twice each year. Although many of these plans would not be completely workable in every disaster situation, they should be designed to adjust to varying loads of casualties. If the hospital is to be able to serve effectively in a real mass casualty situation, its planning must provide for:

1. Clear designation of hospital disaster leadership and lines of authority.
2. Immediate notification from civil defense, fire, or police officials that a disaster has occurred or is imminent.
3. A plan for the evacuation of all patients and staff in the event of damage or serious threats of damage to the hospital itself.
4. A plan for alerting the in-hospital staff and the off-duty staff.
5. An emergency communications capability, including provisions to prevent overload of the telephone system, backed up by two-way radio.
6. Emergency sources of electrical power and water supply.
7. Predisaster assignment of disaster functions to hospital staff for emergency room or field duty with a disaster medical team, recognizing that physicians may be on the staff of more than one hospital.
8. Recruitment and training of a cadre of laymen for hospital and disaster site support activities.
9. Activation of disaster medical teams or first aid teams to function at the disaster site, as discussed in the foregoing section.
10. Readily available medical kits for use by the teams.
11. Preassembled disaster supply sets or carts for use in the emergency room and other treatment areas.
12. Internal and external traffic control and security, with prearranged police cooperation.
13. A plan to increase available bed space by such means as discharging less ill predisaster patients and setting up cots or beds in hospital areas not normally used for patients.
14. Suspension in disaster of restrictive admission criteria.
15. An expanded emergency department capability for sorting large numbers of incoming casualties and administering lifesaving care pending their movement to definitive treatment areas. The sorting should be done by the most knowledgeable staff members to assure the assignment of proper priorities to the casualty loads.
16. Institution of standardized treatment techniques to insure economical use of available supplies and equipment.
17. A sufficient inventory of essential supplies and equipment to sustain the hospital's disaster operation until resupply could reasonably be expected (see p. 37).
18. Rapid replenishment of necessary supplies from hospital stocks.

19. Modification, as necessary, in the normal medical records system to prevent delay in casualty care. An emergency tag can be attached to the patient for the notation of essential information until regular records can be set up.
20. Provision within the public information system for a greatly increased number of inquiries from the press and from relatives of patients.
21. Arrangements, predisaster, with State licensing boards to utilize the services of out-of-State physicians who may be available in a disaster.
22. Frequent tests and exercises to evaluate the hospital's disaster preparations.

Nuclear Disaster

In war-caused disaster, certain additions and modifications are necessary:

1. First preparations must be made for providing well identified fallout protection for patients and staff so that they can survive the immediate postattack period.
2. All bed-care health facilities (i.e., specialty hospitals, chronic disease and mental institutions, etc.), in addition to general hospitals should plan to provide general medical and surgical care for disaster casualties.
3. Hospitals and hospital-type facilities should prepare to expand their service and bed-space capabilities to at least double their normal patient load or more if their available manpower will permit.
4. Hospitals should prepare to operate with resupply by increasing normal supply inventories to at least a 30-day capability and by acquiring special disaster supplies and equipment.
5. Hospital nuclear disaster plans should be consistent with community civil defense plans and this planning must be fully coordinated with local and regional governmental officials.
6. Complete preparations must be made to set up, staff, and operate Packaged Disaster Hospitals or other emergency health units designed for nuclear disaster.
7. Nonhealth facilities, such as schools, warehouses, churches, hotels, and armories, may be predesignated for health uses, for example, as a PDH operating site or as space for the expansion of an existing hospital.
8. During the shelter period, the hospital may be utilized as a shelter for well persons if it has been so designated and if it provides the necessary protection.
9. Plans should be made for decontamination of all persons entering the hospital who may have been exposed to radioactive fallout. Life-saving treatment, however, should not be delayed in favor of decontamination.

E. DISASTER MEDICAL CARE CENTERS

Natural Disaster

During a disaster such as a flood or hurricane, the Red Cross and welfare agencies frequently set up billeting and feeding centers for displaced persons. Since these people bring with them their existing health problems which may be aggravated by disaster conditions, improvised outpatient clinics staffed by physicians and nurses are often set up in or close to these refugee centers. At least one nurse, with access to medical consultation, is needed for each shelter. In natural and nuclear disaster planning, it would be well to consider where such clinics might be needed and how a hospital or local health personnel could cooperate in providing for their staffing and supply.

NUCLEAR DISASTER

In connection with the Federal Civil Defense Community Shelter Program, space in existing buildings has been designated to house much of the population, principally in urban areas, during the time that radiation levels are dangerously high—a period estimated to be as long as 2 weeks. Many of these shelters are able to house hundreds of people. In rural areas and in some small towns, the population would find shelter in home basements or improvised shelters. Again recognizing the fact that many of the people taking shelter will bring health problems with them or will develop medical problems while in shelter, most approved shelters have been provided with a small quantity and variety of medical supplies (see app. V). There is no assurance, however, that there will necessarily be any skilled health manpower in a particular shelter to use these supplies, and in most cases the supplies would not provide a wide spectrum of therapy.

"Austere Medical Care for Disaster," a reference manual for allied health workers and selected trained laymen (Public Health Service Publication No. 1071-D-1), is a quick guide to treatment based on common symptoms.⁴

Community disaster health planners can take actions to improve further the shelter medical care capability. They can arrange for the assignment, by name, of physicians, nurses, and other health personnel to specific public shelters. Even though those assigned may not always be able to reach their designated shelters in disaster, the assignments would vastly increase the likelihood that there would be a degree of medical care competency in each shelter. Also, a more complete set of supplies should be made available in shelters where there is the possibility of professional medical care to permit a higher level of health care. Such supplies can be provided by: (1) outright purchase of supplies to be stored in the shelters predisaster; (2) acquisition of a kit of emergency medical supplies by each local physician which he would

⁴ Also published by Office of Civil Defense for placement in shelters as "Medical Care in Shelters."

bring with him upon taking shelter; and/or (3) arranging with local supply sources, particularly pharmacies, to maintain sets of supplies from their current inventories which they would gather up at the "take shelter" announcement and bring to designated shelters.

F. PUBLIC HEALTH PROBLEMS

Natural Disaster

While 100—or even several hundred—disaster victims may suffer severe injuries at the time a disaster strikes, hundreds more can be endangered in the days following. Contaminated food and water, disrupted sewage facilities, and greatly increased numbers of disease-carrying insects and rodents all threaten the health of the survivors. There may be temporary shortages of food and supplies. Widespread sickness could quickly become an obstacle to the recovery of the entire locality, especially when many people have fled from their homes and are crowded together in community shelters.

The public health problems stemming from natural disasters can ordinarily be handled without undue strain on existing public health resources. If local capability is overtaxed, the State health department can provide the necessary assistance. If a State health department is unable to respond, it may request assistance from the U.S. Public Health Service. However, because hospitals and other medical care facilities may often be called upon to deal with the consequences of some public health problems, notably communicable disease epidemics, it is desirable that physicians and others with medical backgrounds acquire basic knowledge of public health problems and procedures associated with disasters (see app. III). This knowledge can be obtained from either local or State health department sanitary engineers and sanitarians. Also, it is desirable that public health officials, who are members of a community disaster organization, should become familiar with the policies and character of disaster medical services.

Nuclear Disaster

It is expected that there will be an unprecedented burden of public health problems in a nuclear disaster. Destruction of public utilities, crowded living in public fallout shelters or other emergency housing, improvised sewage disposal, expedient water supplies, spoiled food supplies, and increased rodent and insect population are some of the factors which will make public health a dominant concern postattack.

When there is a local health department in the disaster area, its staff will usually be very small and its facilities limited in comparison with the potential magnitude of nuclear disaster problems. It will often need the assistance of hospitals, clinical laboratories, and other medical facilities, as well as the help of practicing physicians, nurses, veterinarians, dentists, and

others who may not normally perform public health functions, but who work in the closely related area of medical care and who already possess some knowledge of the principles of public health.

When there is no local health department, a member of the health professions may have to take complete responsibility for the initiation of appropriate public health measures, on behalf of local government, until such time as outside assistance becomes available. Thus, in keeping with nuclear disaster planning assumptions, each community should prepare to be self-sufficient. It is, therefore, much more necessary in nuclear than in natural disaster that medical as well as public health personnel be well versed in disaster public health problems and procedures. The potential threat of epidemics following the shelter period could be significantly reduced by preattack immunizations, especially for polio, tetanus, and diphtheria.

G. COMMUNICATIONS

Natural Disaster

The lack of good communications causes confusion and wasted effort in disaster operations and can cause more loss of life and increased suffering. Existing telephone systems of hospitals and those at other vital health facilities should be arranged so that an overload of calls prompted by the disaster does not prevent vital staff calls from being made or received. These same facilities must also have existing two-way radios which would permit communication with other health facilities as well as communication with key locations in the community. The disaster medical teams and the community ambulances should also be equipped with their own mobile two-way radio equipment.

Radio equipment for health facilities often can be justified solely on the basis of its everyday emergency uses and its purchase can be considered as a necessary operating expense. Certain frequencies have been allocated for hospitals by the Federal Communications Commission (see app. IX). Every community should provide a medical communication system which is capable of contacting other emergency services of the community. Under some circumstances, Federal civil defense matching funds may also be available to local civil defense offices for acquisition of radio equipment for emergency health activities. Local communications facilities and services should be consulted in all planning phases.

Nuclear Disaster

In preparation for nuclear disaster, the communications system of health facilities should be made capable of contacting the local Control Center for Emergency Health Services which in turn should be connected with the Emergency Operating Center for local government and all major subsidiary

health centers (hospitals). The local Emergency Operating Center would provide communication with the State Emergency Operating Center and military establishments in the area.

H. COORDINATION WITH OTHER DISASTER SERVICES

Natural Disaster

The community disaster coordinator must arrange with local police officials to provide necessary traffic control and security services in support of medical care activities at the disaster site, en route to the hospital, and at the hospital. Effective disaster medical care can be seriously hampered if anything is allowed to interfere with the movement and treatment of patients. Hospital parking and loading areas, as well as streets leading to the hospital, must be kept unblocked and the general public cannot be permitted in hospital treatment areas. An identification system should be arranged with police and civil defense officials so that essential medical workers will be able to pass readily through police lines in disaster.

Disaster medical planners must also make arrangements with community agencies (such as the fire department, ambulance companies, and the local Red Cross chapter) to provide rescue, first aid, and casualty transportation services and to assist in first aid activities. Cooperation and coordination between these organizations and the disaster medical teams and hospitals should be insured. The authority of the physician member of the disaster medical team in all matters pertaining to the handling and care of casualties must be clearly understood and agreed upon by all parties.

Nuclear Disaster

In preparation for nuclear disaster, plans must be made for total integration of all community disaster services. Planning must be flexible enough to allow for either a delayed rescue operation in the presence of radioactive fallout or for immediate operation when there is little or no fallout hazard. This planning must provide for an emergency communications system and an accurate monitoring capability.

I. LEGAL CONSIDERATIONS

Natural Disaster

Physicians and members of the allied health disciplines must become acquainted with State and local laws affecting their liability status in connection with disaster activities. The nature of their participation in training, test exercises, and actual disaster operation should be consistent with such laws which vary considerably from one jurisdiction to another (see app. II).

Nuclear Disaster

Each State has some legislation which is applicable to the legal aspects of medical care in the event of nuclear disaster. Several models of suggested State legislation have been developed by the Office of Civil Defense and the Council of State Governments. A community or State emergency planning group must investigate the particular legislation in their State and surrounding States, as applicable.



ROLE OF THE MEDICAL PROFESSION

A. RESPONSIBILITIES

The medical profession consists of all licensed doctors of medicine and osteopathy, their professional schools, and their local, State, and national societies and organizations. In general, the predisaster responsibilities of the profession consist of providing leadership for and participation in:

1. Disaster planning and organizing.
2. Coordination with other emergency services in the community.
3. Recognition, within the profession, of the principles of disaster medicine.
4. Training and orientation of physicians and members of the allied health disciplines to apply most efficiently their particular skills and knowledge to the support of disaster medical care.

B. THE PHYSICIAN

Natural Disaster

The individual physician, whatever his status—highly specialized, administrative, retired, or otherwise—should:

1. Assume leadership responsibilities and offer his services in planning, organizing, and training.
2. Be able to provide resuscitative and other lifesaving emergency medical care and have a basic understanding of casualty sorting and other mass casualty care techniques.
3. Have a working knowledge of disaster public health problems and procedures.
4. Accept a disaster assignment in a hospital or other disaster health unit.
5. Become acquainted with the provisions of local disaster plans.
6. Acquire a general understanding of Federal and State disaster programs (including the Community Shelter Program, Medical Self-Help, and Packaged Disaster Hospital programs).
7. Be familiar with the disaster policies and programs of the American Medical Association and the national organizations of the allied health professions.

Nuclear Disaster

The physician's preparedness responsibilities for nuclear disaster are much the same as those for natural disaster. He should, however, give emphasis to the following:

1. Becoming conversant with the principles and procedures of mass casualty care so that he will be able to provide lifesaving care for casualties, regardless of his specialty.
2. Taking an active part in planning, training, and other preparations to use the Packaged Disaster Hospital. Even if his own community does not have such a unit, he should be familiar with the procedures for setting up and using it should he be sent in disaster to a community where a PDH is stored. Complete information is available from the Public Health Service, Division of Emergency Health Services (see app. VI, pertinent publications available from DEHS).
3. Being able to diagnose and treat radiation sickness and keeping abreast of physical effects of the latest developments in weapons of mass destruction (including chemical and biological warfare agents).
4. Promoting and assisting in local Medical Self-Help training.
5. Recognition of the need for joint participation of medical and allied health personnel in preparation, rehearsal, and operation of State and local community emergency health service plans.

Following a nuclear attack, physicians will be needed in three major areas. Once casualties begin arriving at hospitals, the full-time services of every available physician will be required for an extended period. As soon as possible, outpatient services should be set up to treat ambulatory casualties and nontraumatic morbidity. The third priority for physician services will be on teams who will concentrate on providing sanitation of the environment, mass immunizations, and professional consultation for persons being cared for on a self-help basis. Meeting these contingencies would mean that the usual private practice by physicians would cease in the severely affected areas.

C. THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association is dedicated to the promotion of "the science and art of medicine and the betterment of public health." Its responsibility in disaster medicine is to provide direction for an informed membership.

The Association's Council on National Security and Committee on Disaster Medical Care carries out a number of important functions devoted to disaster medicine, equally applicable to natural and nuclear disaster. These may be summarized as follows:

1. Assisting in the development of Federal and State disaster and civil defense programs and maintaining liaison with all Federal agencies concerned with the health and medical aspects of disaster.
2. Providing counsel and advice on disaster medical care to State and component medical societies.

3. Fostering increased interest and participation in disaster preparedness by physicians and members of the allied health disciplines.
4. Defining the physician's disaster leadership responsibilities and providing education for physicians in the field of disaster medicine.
5. Promoting national and regional meetings on disaster medicine for physicians and members of the allied health disciplines.
6. Providing a source of current reference material and other information on all phases of disaster planning.
7. Publishing reports, policy statements, and manuals for physicians and the State and county medical societies including AMA Policy Statement on Shelters (see app. VII).

D. THE STATE MEDICAL SOCIETY

Most State medical societies maintain a commission, council, or committee on disaster medical care which performs several services or functions as follows:

1. Advising and counseling the Governor and the State office of civil defense and State health officer on the medical matters pertaining to disaster, including planning, programming, and the stockpiling of medical materiel within the State.
2. Conducting liaison with the State health department on disaster matters.
3. Promoting education in disaster medical care for physicians and health officers and allied health disciplines within the State.
4. Providing advice and leadership to component medical societies in local or regional disaster planning.
5. Maintaining liaison with neighboring State medical societies and health departments in the conduct of mutual aid programs in disaster.
6. Providing information on locations of Packaged Disaster Hospitals and about the Medical Self-Help program.

E. THE COMPONENT MEDICAL SOCIETY

The component medical society represents the physicians of the community. Most societies maintain a disaster committee which performs the following basic functions:

1. Providing counsel, direction, and leadership on the planning and organizing of local emergency medical services, in cooperation with local government, hospital associations, and other agencies in the community.
2. Keeping the society's membership informed of all developments in community disaster planning and acquainting members with their pre- and post-disaster responsibilities.

3. Assisting in the development and coordination of local hospital disaster plans.
4. Maintaining an inventory of professional personnel, and assisting in giving and recording predisaster assignments in disaster medical and health activities.

The preparedness responsibilities of National, State, and local medical societies are much the same for nuclear as for other disasters. Particular emphasis should be given to keeping their respective memberships informed of the latest developments in civil defense and emergency health preparedness and promoting and assisting in the Medical Self-Help, Packaged Disaster Hospital programs, and the Community Shelter Program.

F. THE NATIONAL MEDICAL SCIENTIFIC SOCIETIES

The national medical scientific societies should develop and define their own and their members' role in disaster planning. The cooperation, support, and counsel of these scientific bodies are necessary in order to provide for the most meaningful participation of their members in various phases of disaster medicine.

G. THE MEDICAL SCHOOLS

For the past five years, each medical school, assisted by funds from the Medical Education for National Defense (MENDEF) program, has included some disaster medical content in its curriculum. In general a basic program should include these areas of emphasis:

1. First aid.
2. Emergency medical care.
3. Sorting.
4. Environmental sanitation.

In addition to emphasizing emergency preparedness for the undergraduate students, each medical school should also cooperate in local disaster planning to establish its role in community disaster services, and it should provide instructors for community postgraduate and lay programs in disaster medical care.

For the special circumstance of nuclear war, medical schools should make plans for postattack resumption of teaching, which should involve such considerations as relocation and adjustments in the curriculum, including standards of teaching.

ROLE OF THE ALLIED HEALTH DISCIPLINES



ROLE OF THE ALLIED HEALTH DISCIPLINES

The daily practice of medicine and the provision of normal community public health services require the participation of a large number of allied health workers. Almost every individual who, in his daily work, contributes to the medical and public health services of his community is a member of an allied health profession, discipline, or occupation. The majority of these people are found in the hospital, but many work in clinics, physicians' offices, laboratories, pharmacies, educational institutions, industries, health departments, and government agencies.

The schools of the various allied health disciplines are important in preparing the members of these professions for a role in disaster health care. Disaster orientation can be included in the curriculum in two ways:

1. Correlation of the basic scientific principles with emergency health care principles.
2. Identification of basic procedures and techniques already in the curriculum, emphasizing their use in a disaster situation.

Natural Disaster

The principal role of the allied health disciplines in natural disaster is to provide the necessary emergency services for which they are best equipped by virtue of their training and experience. Where these disciplines have local, State, or National organizations, their appointed disaster committees should establish the appropriate emergency roles for their memberships and should organize training programs where indicated. In establishing these roles, the organizations should work closely with their counterpart in the medical profession—the American Medical Association, State or component medical society, and with the U.S. Public Health Service, or State or local health department. At all levels, they should make certain that the emergency roles assigned their members are in accord with medical and health disaster plans and State or local laws.

In preparing for natural disasters, allied health workers should:

1. Become acquainted with the principles of disaster medicine.
2. Learn the disaster aspects of their own specialties.
3. Participate in refresher courses or other training necessary to sharpen those skills relating to their specialties which have greatest disaster applicability.
4. Participate actively in local disaster medical care and public health preparedness programs.

5. Receive instruction in Medical Self-Help, Red Cross first aid, or other types of first aid up to the highest level available in the community. They should plan and train only for the performance in natural disaster for procedures that are within the normal legal practices of their specialties.

Nuclear Disaster

In planning for a nuclear disaster, allied health workers should become acquainted with basic civil defense principles, with predicted nuclear attack effects, and with their own nuclear disaster roles (as suggested by their own organization or as provided by local disaster plans).

The nuclear disaster planning and training of each of the allied health professions should be based upon the realization that their greatest contribution to a system of emergency care services will be in performing tasks based upon their own skills and knowledge. A system which attempted to keep in readiness a body of professional medical skills and knowledge outside of a discipline's basic daily functions or licensure would not be economically feasible or professionally desirable.

ROLE OF GOVERNMENT



ROLE OF GOVERNMENT

The principal responsibility for promoting and coordinating preparedness for nuclear disaster as well as for controlling and coordinating essential services in a disaster rests with government. The general responsibilities of government at Federal, State, and local levels are described in the National Plan for Emergency Preparedness¹ (as are the responsibilities of nongovernmental organizations and the general public).

A. THE FEDERAL GOVERNMENT

The President has assigned particular disaster preparedness responsibilities to Federal agencies in accordance with their respective capabilities. Primary responsibility for emergency medical care and public health preparedness is given to the Public Health Service in the Department of Health, Education, and Welfare. That agency is charged with preparing for effective use of Federal health resources in disaster and for developing and providing guidance and other assistance to States and communities in the furtherance of their emergency medical care and public health capabilities. In carrying out this charge, the PHS works closely with national health organizations.

Federal assistance which can further preparedness for any disaster, natural or nuclear, includes:

1. Program advisors assigned to States by the Division of Emergency Health Services to work directly with State and community personnel in planning for preparedness in emergency medical care and public health measures.
2. Guidance publications and training materials concerning various phases of health and medical preparedness.
3. Hospital Reserve Disaster Inventory units assigned to community hospitals to provide a 30-day supply of critical medical items needed for disaster care.
4. Packaged Disaster Hospitals assigned to hospitals in strategically located communities to permit those hospitals to expand their patient-load capacity by an additional 200 beds.
5. Medical Self-Help training to prepare the general public to meet its own health needs in a disaster when a physician may not be available, in effect supplementing professional health and medical services at a time when they will be greatly in demand.

¹ Edited and published by Office of Emergency Planning, Executive Office of the President, December 1964.

Natural Disasters

Public Law 90-174, the Partnership for Health Amendments of 1967, authorizes the Secretary of Health, Education, and Welfare to "enter into agreements providing for cooperative planning between Public Health Service medical facilities and community health facilities to cope with health problems resulting from disasters, and for participation by Public Health Service medical facilities in carrying out such planning. He may also, at the request of the appropriate State or local authority, extend temporary assistance to States or localities in meeting health emergencies of such a nature as to warrant Federal assistance."⁶

Nuclear Disaster

Postattack, the Federal Government will:

1. Make available for community service its nonmilitary health facilities, such as Veterans Administration and Public Health Service hospitals, and other field facilities and personnel.
2. Provide professional and technical advice and consultation to States.
3. Apportion federally controlled health and medical resources among the States, in accordance with their relative needs.

B. THE RED CROSS

As a national voluntary organization chartered by Congress, the American National Red Cross is charged to "... continue and carry on a system of national and international relief in time of peace and apply the same in mitigating the sufferings caused by pestilence, famine, fire, floods, and other great national calamities, and to devise and carry on measures for preventing the same."

The Red Cross collaborates closely with agencies of government at each level, and with professional and other community organizations, in developing disaster preparedness measures and in implementing them when disaster occurs. In a natural disaster, the Red Cross is primarily responsible for the welfare of disaster victims. In a national emergency, the Red Cross would support and assist the emergency health services at the community level according to overall plans worked out preattack.

C. THE STATE GOVERNMENT

Natural Disaster

The State Government, through its State department of public health, prepares for effective use of State health resources and guides and assists

⁶ At the time this pamphlet was published, the Public Health Service was developing two pilot programs to supplement local medical resources in the event of major natural disasters: the Natural Disaster Hospitals and Mobile Disaster Medical Teams. These programs are designed to provide for the rapid dispatch of materials and medical manpower when local or State resources are unable to care for disaster causal.

communities in their emergency health and medical preparations. It works closely with the State medical society, hospital association, and other State health organizations. The predisaster assistance provided to communities includes:

1. Preparation for Federal emergency health assistance.
2. Providing training in various aspects of disaster health and medical operations.
3. Storing in the community State-owned sets of supplies for first aid stations or other medical care units.
4. Providing guidance publications and training materials on health and medical preparedness.
5. Clearing and assisting with arrangements by its community hospitals to accept responsibility for Packaged Disaster Hospitals and Hospital Reserve Disaster Inventory units.
6. Determining the legal responsibilities of physicians and allied health personnel in disaster (see app. II).

Nuclear Disaster

Postattack, the State Government will:

1. Provide professional and technical advice and consultation to communities.
2. Make State health facilities and personnel available for service in communities.
3. Apportion State-controlled health resources, including the PDH and others made available from Federal sources, among communities in accordance with their relative needs.

D. THE LOCAL GOVERNMENT

Local government is responsible for preparing the community to deal with disaster effects and for controlling and coordinating disaster relief operations, including medical care and public health services. The support of community leaders, organizations, and agencies must be enlisted in achieving disaster preparedness. A disaster plan describing the organization of local government for emergencies should be prepared. A disaster center, from which all disaster services can be coordinated, should be established. Leaders for each essential disaster service must be designated predisaster. They will, in turn, designate assistants to aid them in planning, training, and coordinating other preparations for effective operation of their respective services.

The physician who is designated to direct disaster health and medical activities becomes the agent for the government in preparing for and carrying out disaster medical care and public health services.

ROLE OF THE ARMED FORCES

Natural Disaster

In natural disaster, Federal military assistance to civil authorities may be provided at the request of a local civil government. Use of resources will be on a minimum essential basis and terminated as soon as possible. In event of a dire emergency an individual commander may act on his own initiative when immediate action is essential to save human life, prevent immediate human suffering, or mitigate major property damage or destruction.

Civil Defense

Those military resources which can be spared from the military mission may be made available to assist with civilian preparedness. The national fallout shelter survey is managed by the Office of Civil Defense. It is conducted in tandem by the Army Corps of Engineers and U.S. Navy. The Defense Supply Agency conducts the shelter survival supplies program. The Army Strategic Communications Command provides and manages civil defense communications.

Plans for military support of civil defense in the event of an enemy attack call for the Armed Forces to "... be prepared to employ available resources which are not engaged in essential combat, combat support, or self-survival operations, to assist civil authorities to restore order and civil control, return essential facilities to operation, prevent unnecessary loss of life, alleviate suffering, and take other actions as directed to insure national survival and a capability on the part of the Nation to continue the conflict." Department of Defense Directive 3025.10 assigns the primary responsibility of military support of civil defense to the Department of the Army. For further information, see either "Federal Register," 30, (71) 4753-4756 Apr. 14, 1967, or "Federal Civil Defense Guide," April 1965, Part G, ch. 3.

SUMMARY

While primary responsibility for disaster preparedness and provision of disaster services rests with government, the government, by itself, can accomplish little. Government at all levels must provide direction and authority for the management of disaster. Effective disaster health services can only come about through coordination with other activities, particularly communications. The active interest, support, and participation of all physicians and allied health workers are necessary to accomplish the aims and apply the principles set forth in this book.

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Appendix I

DISASTER TAXONOMY

A. The Natural Disaster Spectrum

(All disasters exclusive of direct wartime contingencies.)

1. *Nature's Threat* (contingency examples)

- a. Hurricane
- b. Cyclone
- c. Tornado
- d. Blizzard (snow, hail, sleet)
- e. Earthquake
- f. Flood (slow rise, flash, ice jam)
- g. Windstorm
- h. Temperature extremes
- i. Drought
- j. Avalanche
- k. Volcano eruptions
- l. Tidal wave
- m. Forest and grass or brush fire
- n. Lightning strike

2. *The Sociological Threat*

- a. Public transportation:
 - (1) Aircraft—
 - (a) Direct effect of collision or crash
 - (b) Direct and indirect effects of crash on occupied ground areas
 - (c) Military aircraft accidents involving weapons cargo (radiation-explosives)
 - (d) Airfreight shipments of noxious, dangerous, or infectious materials released at crash scene
 - (2) Surface (land)—
 - (a) Train accidents including elevated and subway:
 - (1) Direct passenger effects
 - (2) Effects on occupied environment—freight contents, fire, physical
 - (b) Bus accidents—inter- and intra-city:
 - (1) Direct effects on passengers
 - (2) Direct and indirect effects on occupied environment

- (c) Automobile accidents:
 - (1) Direct effects on passengers
 - (2) Effects on occupied environment
- (d) Trucking accidents:
 - (1) Direct effects on persons
 - (2) Effects on occupied environment as related to physical impact, release of dangerous materials, fire, and explosion
- (3) Water
 - (a) Large vessel collision:
 - (1) Passenger and crew involvements
 - (2) Freight contents, explosion, fire, release of noxious materials
 - (b) Freight, pier, and surrounding environment involvements of vessels in anchorage, in transit, in harbor, or in dock
 - (c) Recreational small craft and related public involvements including racing events
- b. Food, water, and airborne disaster threat:
 - (1) Food poisoning including food additives
 - (2) Chemical contamination of air and water
 - (3) Infectious disease epidemic etiologically related to food, water, or air contaminants
- c. Industrial complex:
 - (1) Mine disasters
 - (2) Fires, explosions, and other catastrophes—direct and indirect effects
 - (3) Construction hazards
 - (4) Occupational hazards inherent to specific industries other than accident
- d. Recreational—public gatherings both as to participants and spectators:
 - (1) Grandstand collapse—roof collapse
 - (2) Facility fire or explosion
 - (3) Runaway vehicles involving occupied spectator zones
 - (4) Mob emotion—panic
- e. Institutional fire, collapse, and explosion:
 - (1) Schools and related dormitories
 - (2) Hospitals
 - (3) Churches
 - (4) Fraternal facilities
 - (5) Nursing homes
- f. Public buildings including residential apartment complexes—fire, explosion, or collapse:
 - (1) Office buildings
 - (2) Multiple-dwelling units
 - (3) Hotels

- (4) Department stores
- (5) Warehouses
- (6) Bus, train depots, and airports
- (7) Docks and piers--passenger and freight
- g. Refugee and high influx of population--health hazard implications involving mass movements of people
- h. Epidemics--any cause
- i. Riots, insurrections, and panic (mob movements)
- j. Homicide including criminal bombing and arson of occupied conveyances and facilities
- k. AEC facilities and nuclear testing including commercial nuclear reactors--accidents
- l. Dam breaks
- m. Collapse of occupied bridges
- n. Power blackout

B. The Nuclear Attack Threat

- 1. Loss of Health Resources**
 - a. Health manpower analysis
 - b. Facility availability
 - c. Supply and equipment availability
- 2. Concurrent Loss of Essential Supporting Services**
 - a. Communication
 - b. Transportation
 - c. Rescue, fire, police
 - d. Utilities
- 3. Radioactive Fallout**
 - a. Immediate denial of access and movement of people and things
 - b. Immediate and delayed medical care concepts
- 4. Contingency Limitations**
 - a. Complete pin-down or isolation from outside resources
 - b. Interim austere survival measures
 - c. Full implementation of emergency health services

Appendix II

MEDICOLEGAL ASPECTS OF NATURAL DISASTER¹

With but one important exception thus far, there is little reason to believe that negligence law, either as it applies to physicians in particular or as it applies to all persons, will be significantly altered during a period of natural disaster. It is a general and well established principle of our law that nearly everyone is liable for the results of his negligent conduct.

The one exception referred to exists in those States (42 States plus the District of Columbia as of July 1, 1967) which have enacted "Good Samaritan" Laws. Fifteen of these laws cover everyone who renders any kind of medical or first aid care at the scene of an accident or emergency. The remaining 27 States cover only physicians and/or other health personnel. The general purpose of these laws is to relieve from liability for acts of ordinary negligence those persons who come forward to help the injured in certain specified instances, primarily at the scene of an automobile accident.

Certain aspects of the law have always been somewhat influenced by emergency situations. For example, a physician is liable for damages for an assault and battery if he performs an examination or treatment necessitating a "laying on of the hands" without first obtaining an informed consent to do so from his patient. In an emergency, however, where, for example, the patient is unconscious and therefore unable to consent, and particularly where additional harm would likely result to the patient if treatment were not provided, the law supplies the necessary consent on the theory that the patient would consent if he could. In such a case the physician may proceed with whatever treatment the nature of the injuries might indicate.

Another instance in which an emergency provides help to a person injured in an accident is found in many of the State medical practice acts. Ordinarily anyone who performs an act which constitutes the practice of medicine must have a license from his State board of medical examiners. Without such license he is subject to prosecution which may result in fine or imprisonment or both. Many of the medical licensing laws exempt persons rendering medical care in an emergency. Many of the medical licensing laws also exempt persons furnishing only first aid.

The fact that an emergency protects a person from prosecution under the medical practice act and from suit for damages under the "Good Samaritan"

¹Summary Statement of American Medical Association, Law Division.

law, should not be construed as (unlimited) authority in rendering medical assistance. Persons with a minimum training in first aid procedures should not feel that these laws will allow them to do a complicated fracture reduction or a tracheotomy with complete immunity. The "Good Samaritan" laws, without exception, provide that the persons covered shall be guilty for the consequences of gross negligence. It is highly likely that a judge or jury, hearing a case many months after the emergency and in a courtroom rather than at the scene of suffering and confusion, would say that any person who undertook procedures for which he had absolutely no training or aptitude was grossly negligent. The immunity provided by the "Good Samaritan" laws is not a license to ignore common sense!

The seriousness of an emergency would no doubt influence one's opinion. Some acts of mercy, perhaps well intended but stupid, would not be countenanced at the scene of an automobile accident but would be welcome during an atomic attack or earthquake or other widespread and prolonged catastrophe.

In conclusion, during a period of natural disaster many acts will be done with the best of intentions. When things return to normal, some of these acts may be questioned in a civil suit for damages. Everyone, physicians included, will be held liable for the consequences of his gross negligence. Everyone, physicians included, should therefore restrain his zeal and should limit his aid to acts which he has good reason to believe he can successfully perform without adding to the injuries the recipient has already received. It is highly unlikely that any judge or jury would assess damages against a physician who was known to have acted with reasonable care and good intentions during a natural disaster or other widespread catastrophe. Medicolegal liability in such a circumstance is extremely remote.

Appendix III

BIOLOGICALS

The National Medical Stockpile Program is authorized three biological products: (1) Tetanus toxoid to be used during the first 30 days postattack; (2) combined tetanus-diphtheria vaccine; and (3) triple strain oral polio vaccine to be used up to 6 months postattack.

The Public Health Service Advisory Committee on Immunization Practices has issued recommendations on typhoid immunization as follows:

"Routine typhoid immunization is not recommended in the United States. Selective immunization is, however, indicated in the following situations:

- (1) *Intimate exposure to an unen typhoid carrier as would occur with continued household contact.*
- (2) *Community or institutional outbreaks of typhoid fever.*
- (3) *Foreign travel to areas where typhoid fever is endemic.*

"Although typhoid vaccine has been suggested for individuals attending summer camps and those in areas where flooding has occurred, there are no data to support continuation of these practices."

Appendix IV

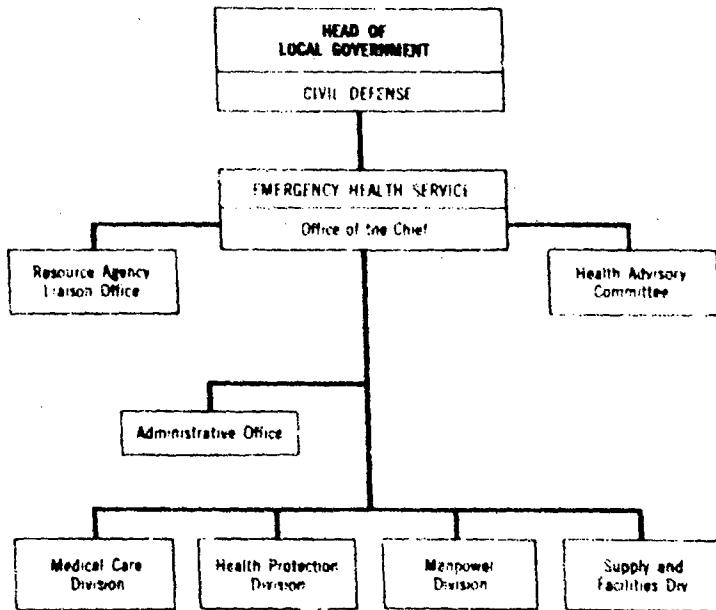
EXAMPLE OF COMMUNITY EMERGENCY HEALTH SERVICE ORGANIZATION AND FUNCTIONS

Any community of sufficient population and resources to organize for civil defense should number among its disaster agencies an emergency health service. Wherever established, its basic functions will be the same, although staffing patterns and the number of organizational subunits will vary greatly.

The basic functions of the Emergency Health Service are: (1) provision of essential medical care; (2) preventive or corrective actions to counteract existing or threatened health hazards; (3) management of health manpower, supplies and equipment, and health facilities to assure maximum effectiveness of utilization; and (4) procurement of supporting supplies and services.

A typical organization might be structured and functions assigned as follows:

I. EHS ORGANIZATION



II. FUNCTIONAL STATEMENTS

A. Office of the Chief

Keeps the head of local government and the State EHS informed of the health situation and health resources available and required; establishes local health policies; determines and directs the most effective actions to provide essential health services; and controls and manages health resources so as to achieve maximum effectiveness of utilization.

B. Resources Liaison Office

Coordinates with appropriate local disaster services for allocation of supporting supplies and services to health activities.

C. Administrative Office

Provides administrative, personnel, fiscal, communications, and other office services. Prepares vital statistics records from hospital and mortuary service reports.

D. Medical Care Division

Establishes criteria and priorities for medical care and treatment; controls and coordinates operations of all medical care units; e.g., expansion—and relocation, if necessary—of all hospitals, activation and deactivation of outpatient clinics, emergency treatment units, medical care field teams, clinical laboratories, blood banks, and collecting units. Directs distribution or redistribution of patients, staff, and supplies. Provides policy on use of medical supplies and equipment and facilities in short supply.

E. Health Protection Division

Controls and coordinates the operations of all health protection activities; e.g., operation of field teams to perform or arrange for necessary actions where damage to facilities, movement of people, overcrowding, or other factors create or threaten environmental health problems; inspection of bulk supplies of food and drugs, decontaminating stocks when feasible or destroying them when appropriate; conduct of communicable disease investigation and control activities. Expands public health laboratory service and converts predesignated laboratories to public health functions.

F. Manpower Division

Keeps EHS Chief and State EHS informed of availability of and requirements for health and supporting manpower; as directed, effects distribution or redistribution of health manpower among operating units; interprets and implements State and Federal policies pertaining to health manpower; maintains liaison with the local manpower agency for assistance in procuring health and supporting manpower; and provides guidance and assistance in re-institution of EHS training activities.

G. Supply and Facilities Division

Keeps EHS Chief and State EHS informed of availability of and requirements for health supplies and facilities. As directed, effects distribution of health and supporting material among operating units; interprets and implements Federal and State policies pertaining to procurement and distribution of controlled health end-items; issues standards on conservation, salvage, destruction, reissue, and storage of health supplies and equipment

Appendix V

MEDICAL KITS—PUBLIC SHELTER PROGRAM

Nomenclature	Unit issue	Kit "A" for 50 occupants (quantity)	Kit "C" for 300 occupants (quantity)
Aspirin (500's)	Bottle	1	
Aspirin (1,000's)	do		3
Cascara sagrada tablets (100's)	do	1	6
Eugenol (1 oz.)	do	1	1
Eye and nose drops (½ oz.)	do	3	18
Isopropyl alcohol (1 qt.)	Can	1	6
Kaolin and pectin mixture (1 pt.)	Bottle	1	6
Penicillin G, tablets 250,000 units (100's)	do	2	12
Petrolatum, white (1 lb.)	Can	1	3
Phenobarbital tablets ½ gr. (500's)	Bottle	1	
Phenobarbital tablets ½ gr. (1,000's)	do		3
Soap, surgical with 2 percent Hex (1¾ oz.)	Cake	6	36
Sodium bicarbonate	Can	1	2
Sodium chloride	do	1	2
Sulfadiazine tablets 7½ gr. (500's)	Bottle	1	
Sulfadiazine tabs 7½ gr. (1,000's)	do		3
Tablet, water purification, iodine (50's)	do	2	12
Bandage, gauze, roller 2 in. by 6 yd. (12's)	Package	1	6
Bandage, muslin 37 by 37 by 52 in.	Each	1	6
Cotton, purified (1 lb.)	Package	1	3
Pads, gauze, surgical 4 by 4 in. (200's)	do		6
Applicator, wood, cotton tip end ½ by 6 in. (100's)	do	1	6
Depressor, tongue, wood (100's)	Box	1	3
Forceps	Each	1	1
Pin, safety, 1½ in. (12's)	Package	3	12
Scissors, pocket, straight 4 in.	Each	1	3
Syringe, fountain	do	1	1
Thermometer	do	1	4
Fiberboard container	do	1	1
<i>Medical Care in Shelters</i>	do	1	1

Appendix VI

PUBLICATIONS

The American Medical Association has prepared the following publications which also deal with disaster preparedness planning:

Role of the Physician in Disaster Medicine (1965) 4300-717B
An Index to Literature on Disaster Medical Care—A Guide for the Physician (1966)

Guide to Developing an Industrial Disaster Medical Service Council of Occupational Health, American Medical Association

The Division of Emergency Health Services has prepared a number of publications for the guidance of emergency health preparedness planners.

Publications in the Emergency Health Series are divided into 10 subject categories as follows:

- A. Emergency Health Service Planning
- B. Environmental Health
- C. Medical Care and Treatment
- D. Training
- E. Health Resources Evaluation
- F. Packaged Disaster Hospitals
- G. Health Facilities
- H. Supplies and Equipment
- I. Health Manpower
- J. Public Water Supply

Titles which deal with the Packaged Disaster Hospital or which are of directly related interest are listed below. These publications are available, upon request, from your State Health Department, Civil Defense Office, or the Division of Emergency Health Services, Public Health Service, Chevy Chase, Md. 20015.

Packaged Disaster Hospital

Establishing the Packaged Disaster Hospital (Revised 1966) PHSP No. 1071-F-1.

X-ray Section of the Packaged Disaster Hospital (Revised 1966) PHSP No. 1071-F-2.

Clinical Sterile Supply Section of the Packaged Disaster Hospital (1966) PHSP No. 1071-F-3.

Laboratory Section of the Packaged Disaster Hospital (Revised 1966) PHSP No. 1071-F-4.

Operation of Generators in the Packaged Disaster Hospital (Revised 1968) PHSP No. 1071-F-5.

Water Supply Management in the Packaged Disaster Hospital (1965) PHSP No. 1071-F-6.

*Storage Structures Erected for Pre-positioned Civil Defense Emergency Hospitals*¹ (1964) PHSP No. 1071-F-7.

Packaged Disaster Hospital Custodian's Handbook (Revised 1965) PHSP No. 1071-F-10.

Nurses' Ward Management Guide for the Packaged Disaster Hospital (1965) PHSP No. 1071-F-12.

Pharmacy Section of the Packaged Disaster Hospital (1966) PHSP No. 1071-F-13.

Assembling Equipment in the Packaged Disaster Hospital (1966) PHSP No. 1071-F-14.

Illustrated Catalog and Guide for Distribution of Packaged Disaster Hospital Materials (1965) PHSP No. 1071-F-15.

Check List for Developing a Packaged Disaster Hospital Utilization Plan PHSP No. 1071-F-16 (Revised 1968).

General Stores Section of the Packaged Disaster Hospital (Revised 1968) PHSP No. 1071-F-17.

Related Material

Emergency Health Preparedness Publications Catalog (1966) PHSP No. 1071-A-1.

Community Emergency Health Preparedness (1964) PHSP No. 1071-A-2.

Health Materiel and Facilities Planning Guide for Emergency Management (1965).

Therapeutic Guide for Pharmaceuticals in the Packaged Disaster Hospital (1965) PHSP No. 1071-C-1.

Orientation Manual on Disaster Preparedness for Pharmacists (1965) PHSP No. 1071-D-7.

Hospital Planning for National Disaster (Revised 1968) PHSP No. 1071-G-1.

Preparing the Hospital Plant for Emergencies (Revised 1968) PHSP No. 1071-G-2.

Community Emergency Health Manpower Planning (1966) PHSP No. 1071-I-1.

The Role of the Pharmacist in National Disaster (1965) PHSP No. 1071-I-4.

Austere Medical Care for Disasters (1964) PHSP No. 1071-D-1.

¹ Now called the Packaged Disaster Hospital. This publication will reflect this name change when it is reprinted.

Material Available from Other Agencies

An Operational Concept of an Emergency Medical Demand and Communications Systems R. E. Shoemaker, 1967 (No. 653-10-1).

Treatment of Acute Radiation Injury Under Medicolegal and Other Conditions M. Ingram, M.D., 1967 (No. 657-178).

The Effects of Nuclear Weapons AEC, 1962 (Department of the Army Pamphlet No. 39-3).

In Time of Emergency Office of Civil Defense Number H-11: 1968.

Treatment of Mass Civilian Casualties in a National Emergency Medical Education for National Defense, Washington, D.C.

Appendix VII

This statement was approved by the Board of Trustees of the American Medical Association, September 1964, after being referred and recommended by the Council on National Security upon the approval of its Committee on Disaster Medical Care.

AMA POLICY STATEMENT ON SHELTERS

The American Medical Association, having knowledge of the high casualty producing potential of atomic weaponry, is gravely concerned with the possibility of large numbers of casualties following a nuclear or thermonuclear attack. The Association favors any and all reasonable measures that would lessen that potential.

The development and possible utilization of high yield weapons, however, tends to increase that potential, for after the detonation of such devices there may be serious effects from radioactive fallout extended over wide areas.

There is currently sufficient scientific information available to indicate that adequate shielding is an effective defense against such eventuality. As physicians, we understand and appreciate the hazards of uncontrolled radiation exposure and, therefore, favor means which would protect the citizenry from such hazards to the extent possible.

It has been demonstrated that adequate shielding can be provided through the utilization of core areas of some presently existing structures as well as through minimal modification of new construction.

Within the capabilities of skillful engineering design, strategic location, warning time, and the limitations dictated by financial considerations, the American Medical Association recommends that further implementation be given to a program which would provide the fullest possible employment of fallout shelters for the protection of citizens as an essential element of the overall defense posture of the United States.

The Association further urges the enactment of continued legislation which will provide strong economic and other motivation for the construction and maintenance of fallout shelters by communities or individuals or both.

Appendix VIII

ACTIVATION OF FACILITIES IN FALLOUT AREAS

Four factors enter into the determination of the availability for post-attack operational use of an installation in an area of fallout: (1) Fallout radiation intensity as measured by survey instruments; (2) time after the nuclear weapon detonation producing the fallout; (3) maximum equivalent residual dose (ERD) of radiation to be permitted to people occupying the installation; and (4) average fallout protection factor (PF) provided to these personnel.

The fallout intensity in a particular area is frequently expressed by what is known as the "normalized H + 1 rate," which is a theoretical value representing what the radiation intensity would have been at the location 1 hour after weapon detonation had all the fallout been on the ground at that time. This value can be calculated from factors (1) and (2) above by the radiation monitor.

The maximum ERD to be permitted to personnel is a command decision based on the individual situation. Guidance to establishing a standard is provided in "Exposure to Radiation in an Emergency," Report No. 29 published by the National Committee on Radiation Protection and Measurements.

The average protection factor which can be provided to personnel using the installation is dependent upon the proportion of the time which must be spent during the day at locations with various protection levels; e.g., although sleeping hours may be spent in a fallout shelter area, the duties of personnel during hours of activity may require their presence in less protected areas.

Upon the establishment of the maximum ERD permissible and the average protection factor possible, the availability of or denial to operations in an installation in a fallout field can be determined.

In the tables below examples of immediate availability or denial time of facilities are stated for two normalized H + 1 fallout radiation rates. For each of these radiation levels, information is given for various combinations of ERD permissible and average protection factor available. The following is an example of the method of reading the tables:

1. The H + 1 rate in the area of a facility is estimated by the fallout monitor to be 1,000 r./hr.
2. The average protection factor for workers in the facility over a 24-hour period is estimated to be 5.

- The maximum ERD to be allowed for workers in the facility has been established as 100 r.
- From the first table, the denial time can be read as "3 days," indicating this particular facility cannot be put into operation until the fourth day postattack.

¹DENIAL TIME FOR FACILITIES IN FALLOUT AREAS

H+1 rate: 1000 r./hr.

PF	Maximum ERD permissible			
	50 r.	100 r.	150 r.	200 r.
1	3 months	6 weeks	4 weeks	2 weeks
2.5	4 weeks	2 weeks	1 week	3 days
5	2 weeks	3 days	2 days	1 day
10	3 days	1 day	Immedi- ately	Immedi- ately
20	1 day	Immedi- ately	do	Do.
50	Immedi- ately	do	do	Do.

H+1 rate: 300 r./hr.

PF	Maximum ERD permissible			
	50 r.	100 r.	150 r.	200 r.
1	1 week	1 week	3 days	2 days
2.5	5 days	1 day	Immedi- ately	Immedi- ately
5	1 day	Immedi- ately	do	Do.
10	Immedi- ately	do	do	Do.
20	do	do	do	Do.
50	do	do	do	Do.

¹ Values in tables have been calculated from "t^{1/2} law" for fallout decay and definition of ERD given in "Federal Civil Defense Guide," June 15, 1963, pt. E, ch. 5, app. 1, p. 7.

Appendix IX

PUBLIC SAFETY RADIO SERVICES

Public Safety Radio Services provide, primarily, for the use of radio communications systems by governmental entities meeting eligibility requirements of the Federal Communications Commission rules (Pt. 89, vol. V). These FCC rules may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, for \$2.50.

Requirements for operation of a station in these services include:

1. Station authorization
2. Operator permits
3. Frequency coordination
4. Acceptable transmitting equipment

Various categories of Public Safety Services are:

1. Local Government Radio Service
2. Police Radio Service
3. Fire Radio Service
4. Highway Maintenance Radio Service
5. Forestry Radio Service
6. Special Emergency Radio Service

Eligible users included in this category are hospitals, physicians, and disaster relief organizations.

Federal Communications Commission form 400 is used in filing applications for authorization in the services, and copies of the form and instructions for its completion may be obtained from the Federal Communications Commission, Washington, D.C. 20554. Completed applications should be returned to FCC headquarters.

Appendix X

APPROVALS

On October 7, 1967, the "Role of Medicine for Emergency Preparedness" was given approval by the American Medical Association through its Council on National Security and its Committee on Disaster Medical Care.

Council on National Security

Albert H. Schwichtenberg, M.D., *Chairman*

Oscar P. Hampton, Jr., M.D., *Vice Chairman*

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George W. Paschal, Jr., M.D.

Committee on Disaster Medical Care

George W. Paschal, Jr., M.D., *Chairman*

Wendell A. Butcher, M.D.

Francis C. Jackson, M.D.

Wayne P. Chesbro, M.D.

William T. Runage, Jr., M.D.

At its annual meeting in January 1968, the Committee on Trauma of the American College of Surgeons approved "The Role of Medicine for Emergency Preparedness."

Committee on Trauma

Active Members

Oscar P. Hampton, Jr., M.D., *Chairman*

Moore Moore, Jr., M.D., *Deputy Chairman*

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The purpose of this publication is to provide the physician with an integrated guide to his responsibilities for the development and operation of the emergency health and medical services in his community. The responsibilities and interrelations of other emergency services are broadly defined along with the resources and responsibilities of the State and Federal Governments. Each subject is described under dual headings: Natural Disaster and Nuclear Disaster. This arrangement provides the reader with an opportunity to compare the two levels of disaster preparation and to visualize how preparation for nuclear disaster can often provide the community with an increased capability for responding to the needs of victims of major natural or man-made disasters. Included in the text are discussions of problems which have arisen in communities which have experienced catastrophic local disasters. Provided in the appendices is a variety of technical and reference information which will be useful to the physician in the upgrading of his community's emergency health service capability. This text does not deal with planning and providing for the transportation and care of the victims of automobile accidents or other unexpected trauma and acute onset of illness which are routinely handled by the ongoing emergency services of our hospitals and communities.		

DD FORM 1473
REPLACES DD FORM 1473, 1 JUN 64, WHICH IS
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NATURAL DISASTER																			